

IN THE CLAIMS:

The text of all pending claims, (including withdrawn claims) is set forth below. Cancelled and not entered claims are indicated with claim number and status only. The claims as listed below show added text with underlining and deleted text with ~~strikethrough~~. The status of each claim is indicated with one of (original), (currently amended), (cancelled), (withdrawn), (new), (previously presented), or (not entered).

Please AMEND claim 21 and ADD new claims 27-29 in accordance with the following:

Claims 1-13 (Cancelled).

14. (Previously Presented) A system for controlling at least one of transmission and reception of signals in a radio communication system having a calibration antenna and an array of antenna elements, comprising:

a plurality of transceiving means, each connected to one element of the array of antenna elements, at least one of said transceiving means additionally connected to the calibration antenna, for at least one of transmitting and receiving test signals via the antenna elements;

at least one calibration processor determining variations of the test signals in said transceiving means; and

a beamforming processor taking into account the variations determined by said calibration processor for at least one of beamforming and determination of direction of arrival of radio signals respectively transmitted and received by the antenna elements.

15. (Previously Presented) A system according to claim 14, wherein a transmission gap in a time frame of a time division duplex system is used for transmission of the test signals for determining variations in said calibration processor.

16. (Previously Presented) A system according to claim 15, wherein in said at least one transceiving means connected to the calibration antenna test signals are switched via a switch to the calibration antenna in a calibration process.

17. (Previously Presented) A system according to claim 16, wherein said calibration processor is realized within said beamforming processor.

18. (Previously Presented) A system according to claim 17, further comprising at least one lookup table storing information related to the variations of the test signals.

19. (Previously Presented) A system according to claim 18, further comprising a base band multiplexer connected to said transceiving means, and wherein said at least one calibration processor includes at least two calibration processors, each determining variations for a different radio frequency, connected to said transceiving means via said base band multiplexer.

20. (Previously Presented) A system according to claim 14, further comprising a base station of the radio communication system, in which said transceiving means, said at least one calibration processor and said beamforming processor are located.

21. (Currently Amended) A method for controlling at least one of transmission and reception of signals in a radio communication apparatus having transceivers, each connected to one element of an array of antenna elements, at least one of the transceivers being additionally connected to a calibration antenna, said method comprising:

at least one of a receiver calibration procedure and a transmitter calibration procedure, the receiver calibration procedure including:

generating test signals,

feeding the test signals to the at least one of the transceivers connected to the calibration antenna,

transmitting the test signals via the calibration antenna,

receiving the test signals by the antenna elements and corresponding transceivers,

determining, in at least one calibration processor, reception variations of the test signals in the transceivers, and

taking into account the reception variations, determined in the at least one calibration processor, for determination of direction of arrival of respectively received radio signals by the antenna elements; and

the transmitter calibration procedure[[.]] including

generating the test signals,

feeding the test signals to the transceivers,

transmitting the test signals via the antenna elements,

receiving the test signals by the calibration antenna and the at least one of the transceivers connected thereto,

determining, in the at least one calibration processor, transmission variations of the test signals in the transceivers, and

taking into account the transmission variations, determined in the at least one calibration processor, for beamforming of respectively transmitted radio signals from the antenna elements.

22. (Previously Presented) A method according to claim 21, wherein at least one of the reception and transmission variations of the test signals are determined consecutively for different radio frequencies.

23. (Previously Presented) A method according to claim 22, wherein at least one of the reception and transmission variations of the test signals are determined concurrently for different radio frequencies, using individual calibration processors for the different radio frequencies.

24. (Previously Presented) A method according to claim 23, further comprising determining transfer functions of at least one of transmitting and receiving paths in the calibration processor.

25. (Previously Presented) A method according to claim 24, further comprising determining a maximum of a phase and amplitude difference of a coupling coefficient in each calibration processor.

26. (Previously Presented) A method for controlling at least one of transmission and reception of signals in a radio communication apparatus having communication transceivers, respectively connected to an array of antenna elements, and a calibration transceiver connected to a calibration antenna, said method comprising:

at least one of a receiver calibration procedure and a transmitter calibration procedure, the receiver calibration procedure including:

generating test signals,

feeding the test signals to the calibration transceiver,

transmitting the test signals via the calibration antenna,

receiving the test signals by the antenna elements and corresponding communication transceivers,

determining, in at least one calibration processor, reception variations of the test signals in the communication transceivers, and

taking into account the reception variations, determined in the at least one calibration processor, for determination of direction of arrival of respectively received radio signals by the antenna elements; and

the transmitter calibration procedure, including

generating the test signals,

feeding the test signals to the communication transceivers,

transmitting the test signals via the antenna elements in a transmission gap in a time frame of a time division duplex system,

receiving the test signals by the calibration antenna and the calibration transceiver,

determining, in the at least one calibration processor, transmission variations of the test signals in the communication transceivers, and

taking into account the transmission variations, determined in the at least one calibration processor, for beamforming of respectively transmitted radio signals from the antenna elements.

27. (New) A radio communication system for controlling at least one of transmission and reception of radio signals, having a calibration antenna and an array of antenna elements, comprising:

a plurality of transceivers, each connected to one antenna element of the array of antenna elements, at least one transceiver additionally connected to the calibration antenna via which the at least one transceiver transmits first test signals from the calibration antenna to the antenna elements and/or receives second test signals transmitted from the antenna elements to the calibration antenna;

at least one calibration processor determining variations of at least one of the first and second test signals; and

a beamforming processor taking into account the variations determined by said at least one calibration processor in performing at least one of beamforming and determination of a direction of arrival of the radio signals respectively transmitted and received by the antenna elements.

28. (New) A method according to claim 27, wherein the calibration antenna sends or receives only test signals and communicates to the at least one calibration processor via the at least one of said transceiving means.

29. (New) A method for controlling at least one of transmission and reception of signals in a radio communication apparatus having transceivers, each transceiver being connected to one element of an array of antenna elements, at least one of the transceivers being additionally connected to a calibration antenna, said method comprising:

at least one of a receiver calibration procedure and a transmitter calibration procedure, the receiver calibration procedure including:

generating test signals,

feeding the test signals to the at least one of the transceivers connected to the calibration antenna,

transmitting the test signals via the calibration antenna,

receiving the test signals by each antenna element of the array of antenna elements and each corresponding transceivers,

determining, in at least one calibration processor, reception variations of the test signals received in the transceivers of each antenna element, and

taking into account the reception variations, determined in the at least one calibration processor, for determination of a direction of arrival of radio signals received by any antenna element of the array of antenna elements; and

the transmitter calibration procedure, including

generating the test signals,

feeding the test signals to the transceivers of the antenna elements,

transmitting the test signals via the antenna elements,

receiving the test signals by the calibration antenna and the at least one of the transceivers connected thereto,

determining, in the at least one calibration processor, transmission variations of the test signals in each of the transceivers of the antenna elements, and

taking into account the transmission variations, determined in the at least one calibration processor, for beamforming of radio signals transmitted from each of the antenna elements.